

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the Application of:)
Takeo Yajima) Examiner: Albert Hilton
Title: CHEMICAL LIQUID SUPPLY)
APPARATUS) Group Art Unit: 1792
Serial No.: 10/593,607)
Filed: September 21, 2006) Confirmation No.: 1929
)
) (Docket No.: 4724-0038WOUS)

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**INVENTOR'S DECLARATION MADE UNDER 37 CFR § 1.132
REGARDING ORDINARY SKILL IN THE ART**

Now comes Takeo Yajima, who declares and states as follows:

1. I, Takeo Yajima, hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the enforceability of the above-identified application, any related application, or any patent issued thereon.
2. I am an expert in the field of semiconductor manufacturing systems, and, more particularly, systems for liquid processing of semiconductor wafers. I have been employed by Koganei Corporation since 1989 as a researcher and inventor in this field. I began my work in this field in 1982 after receiving

my bachelor's degree from Nihon University. I have published 42 papers and invention disclosures regarding semiconductor manufacturing systems.

3. I am an inventor of the above-identified invention. I present the following declarations of fact in response to the Final Office Action issued February 1, 2010 in the above-identified application, in response to the Advisory Action issued April 22, 2010 in this application, and further in response to the contentions stated therein that (i) making the components of an apparatus integral to an assembly does not distinguish the integrated assembly over the prior art; and (ii) it would be obvious to incorporate a heat exchanger into an incompressible-medium pump such as the pump 24 taught by my invention Yajima '048 <JP 11-230048>.
4. Regarding the first contention, that it would have been obvious to integrate a pump, a supply valve, and a discharge valve into a dispensing nozzle, this contention contradicts the common wisdom at the time the claimed invention was made. In particular, pump drive units generally have been regarded as sources of particle matter contaminants. Accordingly, pump drive units have been kept apart from the location of semiconductor wafers during processing, in order that the particles generated by pump drive units can be prevented from adhering to the semiconductor wafer. Additionally, pump drive unit motors have been regarded as heat generating sources. Accordingly, pump drive unit motors have been kept apart from the location of dispensing nozzles to prevent instability of a temperature of the chemical liquid being dispensed. For at least these two reasons, the common wisdom in the art at the time of the claimed invention opposed integrating a pump and a nozzle into a common nozzle body assembly. Finally, for precision of movement to control where chemical liquid was dispensed on a semiconducting wafer, the common wisdom preferred to minimize the weight load on a drive unit of a movable arm, so again, the

common wisdom opposed integrating a pump and a nozzle into a nozzle body assembly.

5. Regarding Yajima '048, my invention publication discloses, in paragraph 0004, that a bellows-type pump may tend to accumulate chemical liquid, and that a change of quality of the chemical liquid due to the accumulation may be a cause for occurrence of dust at application. Meanwhile, in paragraph 0006, a pump that uses a flexible tube has problems of obtaining no good pump property and of lacking durability since the accumulation of the chemical liquid can be prevented and since a correspondence relation between a pressure in a pressuring chamber and a deformation of the tube is difficult to desirably set. A chemical liquid supplying device disclosed in Yajima '048 publication is an invention having objects of improving, in view of the above problems, the pump property of the chemical liquid supplying device, and of improving its durability (paragraph 0007). However, the device disclosed in Yajima '048 publication does not include a heat exchanger.
6. Regarding the second contention, that it is obvious to integrate a heat exchanger into the Yajima '048 pump, Yajima '048 teaches an incompressible medium in pressurized chamber 22 causes contraction or expansion of a flexible tube 21, which pumps chemical liquid from a supply-side flow path to an outflow-side flow path. The Examiner proposes that the incompressible medium could be a heat exchange fluid. But if the incompressible medium is a heat exchange fluid, then common wisdom teaches a relative large volume of the incompressible medium and a surge tank connected to the pressurized chamber 22 to accommodate thermal change in volume of the incompressible medium. However, a surge tank connected to the pressurized chamber allows incompressible medium flow to or from the surge tank in preference of contracting or expanding the flexible tube 21. Thus, using the incompressible medium for heat exchange

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Inventor's Declaration Made Under 37 CFR § 1.132

fluid, with a surge tank connected to the pressurizing chamber 22 according to common wisdom, makes the pump 24 inoperable as a pump for chemical liquid through the flexible tube 21.

Respectfully submitted by

T. yajima
[Declarant's name]

Dated

June 8, 2010